6. **CTL$_{F,G,X}$ LAB EXERCISES FOR APRIL 1, 2014**

**Exercise 4 (A familiar automaton).** Consider the automaton in Figure 7.

![Fig. 7. A simple automaton.](image)

Using the algorithm, compute the set of states that satisfies $AF[p]$.

**Exercise 5 (Anamolies in satisfaction).** Consider the two automata $G_1$ and $G_2$ in Figure 8.

![Fig. 8. Two gate models $G_1$ and $G_2$.](image)

First, compute the set of states in $G_1$ that satisfy the formula $AG[down \rightarrow AF[up]]$. Now show that in model $G_2$, $up \models AG[down \rightarrow AF[up]]$.

Next, give a $CTL_{F,G,X}$ property that $up$ in $G_1$ satisfies but $up$ in $G_2$ does not satisfy.

**Exercise 6 (Examining another automaton).** Consider the automaton in Figure 9.

![Fig. 9. Another automaton.](image)

Compute the set of states that satisfies $AF[q]$. Now compute the set of states that satisfies $EF[q]$.